

DEVELOPMENT OF SMP APPLICATION FOR POCKET PC

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ABSTRACT

The purpose of this project is to develop an application that allows students to check their result and personal information via a Pocket PC. This application will interact with server that store and controls the database. The application works only with windows-based mobile phone such as Pocket PC or PDA and it must support GPRS. Due to no direct access to SMP portal through mobile phone and unavailable or limited internet connection in rural area, it's hard for students to check their result or personal information. It's also almost impossible to access the SMP portal while students on the move. Plus, the high transfer rate data of accessing SMP portal through window-based mobile phone causes the high cost needed. The objectives of this project are to develop an SMP application that runs on window-based mobile phone and to develop a database server that will store all data. This project will also provide an alternative access other than SMP portal to check result and view personal information. The application will be installed and run on window-based mobile phone. The application will interact with server through GPRS connection. A valid or matching username and password is required to access the server to ensure the security of user's private data. Data from server will be sent over to application and displayed on the phone. At the end of the project, the application is successfully installed and run on the Pocket PC.

ABSTRAK

Tujuan projek ini dijalankan adalah untuk membangunkan satu aplikasi yang membolehkan pelajar memeriksa keputusan peperiksaan dan maklumat peribadi mereka dengan menggunakan Pocket PC. Aplikasi ini akan berinteraksi dengan satu penyedia pengkalan data yang menyimpan dan mengawal semua data. Aplikasi hanya boleh diguna pakai dengan telefon bimbit yang beroperasi dengan sistem Window seperti Pocket PC atau PDA dan telefon tersebut mestilah mempunyai keupayaan GPRS. Disebabkan oleh ketiadaan akses secara langsung ke portal SMP melalui telefon bimbit dan sambungan internet yang terhad atau tiada di kawasan pedalaman mengakibatkan pelajar-pelajar sukar untuk memeriksa keputusan peperiksaan dan maklumat peribadi mereka. Juga, ketika pelajar bergerak dari satu tempat ke tempat lain adalah mustahil bagi mereka mengakses portal SMP. Tambahan pula, kadar perpindahan data yang tinggi bagi mengakses portal SMP melalui telefon bimbit yang beroperasi dengan sistem Window menyebabkan kos yang tinggi diperlukan. Objektif projek ini dijalankan adalah untuk membangunkan satu aplikasi SMP yang beroperasi pada telefon bimbit yang beroperasi dengan sistem Window dan juga membangunkan satu penyedia yang akan menyimpan kesemua data. Projek ini akan menyediakan satu akses alternatif selain portal SMP bagi pelajar-pelajar memeriksa keputusan peperiksaan dan maklumat peribadi mereka. Perisian aplikasi akan dipasang dan dijalankan pada telefon bimbit yang beroperasi dengan sistem Window. Perisian aplikasi akan berinteraksi dengan penyedia melalui sambungan GPRS. Nama pengguna dan kata laluan yang sah diperlukan untuk mengakses penyedia pengkalan data bagi memastikan keselamatan data peribadi pengguna. Data dari penyedia akan dihantar ke perisian aplikasi dan dipaparkan pada telefon bimbit. Di penghujung projek ini, aplikasi SMP berjaya dipasang dan dijalankan pada Pocket PC.

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LIST OF ABBREVIATION

SMP	-	Sistem Maklumat Pelajar
PPC	-	Pocket Personal Computer
CGPA	-	Cumulative Grade Point Average
GPRS	-	General Packet Radio Service
WAP	-	Wireless Application Protocol
GUI	-	Graphic User Interface
PDA	-	Personal Digital Assistant
OS	-	Operating System
RAM	-	Random Access Memory
GSM	-	Global System for Mobile Communications
XML	-	eXtensible Markup Language

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CHAPTER I

INTRODUCTION

As the world revolves, the technologies of the world evolve in line with it. The technologies developed applied on various fields to make everyday life much easier. Pocket PC for example, is the technology developed so that people can work with a device with capability nearing a personal computer, PC but with a size far smaller than a PC. With this capability, more and much more application developed for this type of device as much more devices produced by companies. Thus, this project concerned about the development of application for Pocket PC that enables students to check their result without having to surf the SMP website.

1.1 Introduction of the Project

Project of Development of SMP Application for Pocket PC is a project of developing application software for Pocket PC that will allow students to check their Cumulative Grade Point Average, CGPA and personal information by using their Pocket PC through General Packet Radio Service, GPRS connection. The Pocket PC used in this project is required to have a GPRS connection. Project will consist of two parts. First part is the development of Web Services application that consists of SMP Web

Service that acts as the middleman between the application and the database server, and the database server that will act as the database server of all students' data. It interacts with the application through GPRS connection. The second part is the development of SMP application that will be installed on window-based mobile phone. The application will allow user to gather information from web service via their window-based mobile phone that have GPRS connection.

1.2 Objective

The objective of the project is to develop a web service application that consists of SMP Web Service that acts as the middleman between the application and the database server, and the database server that will act as the database server of all students' data. Web Services according to World Wide Web Consortium, W3C [1] is defined as a software system designed to support interoperable Machine to Machine interaction over a network. It can be accessed over a network, such as the Internet, and executed on a remote system hosting the requested services.

The second objective is to develop an application that will be installed and run on Pocket PC. The application will interact with the Web Services to gather data from the database and displayed it on the Pocket PC. The application is connected to the Web Services through the GPRS connection.

The third objective of this project is to provide an alternative access other than SMP portal in rural area where internet connection unavailable or limited. This project will also provide an access for students to check their result and personal information while they on the move where practically it is impossible to do so.

1.3 Problem Statement

Problem occurs when we want to access directly to the SMP portal through mobile phone because there is no WAP portal of our university yet. Although we can access our website through window-based mobile phone still its cost a lot because of high data transfer rate.

Accessing SMP portal in rural area could be hard because of internet connection is not available or limited. Thus, for those who live in rural area it will be hard for them to check their latest grade and view their updated personal information.

If we are on the move such as going on vacation or camping, it is almost impossible for us to access SMP portal because of no internet connection. Although most of laptops nowadays are wireless fidelity (Wi-Fi) enabled, not all places have wireless fidelity (Wi-Fi) hotspot area. Plus, majority of wireless fidelity (Wi-Fi) area is only for registered user.

1.4 Scope of Work

The Web Services application developed in this project acts as the middleman between the application and the database server, and the database server that will act as the database server that store of all students' data. Web services do not provide the user with a Graphic User Interface (GUI). Web services instead share business logic, data and processes through a programmatic interface across a network.

The application develops in this project only works with the window-based mobile phone such as Pocket PC or Personal Digital Assistant (PDA). It will not work with other type of operating system mobile phone such as Palm or Symbian.

The Pocket PC used in this project must support GPRS in order for the application to gather data from the database server. GPRS is a standard for wireless communications which runs at speeds up to 115 kilobits per second, compared with current Global System for Mobile Communications (GSM) systems' 9.6 kilobits. Data gathered from database server will be sent over to the application via GPRS connection.

1.5 Overview on Project Methodology

The development of this project is mainly divided into two parts. First part is the development of the Web Services application which consists of SMP Web Service that acts as the middleman between the application and the database server, and the database server that will act as the database server of all students' data. Web Services will communicate with both the application and the database server. It also control all of the data in addition determine the request from the client and choose which data will be sent to the client. Web services unlike Web server or web page system do not provide the user with a Graphic User Interface (GUI). Web services instead share business logic, data and processes through a programmatic interface across a network. Web services allow different applications from different sources to communicate with each other without time-consuming custom coding, and because all communication is in XML, Web services are not tied to any one operating system or programming language.

In the second part of the project is the development of the SMP application that will be installed and run on the window-based mobile phone such as Pocket PC. The application is the client as in client-server architecture. It will interact and request data from the server through some protocol that been agreed by both client and server. Request from client is being processed by the web service and sent over to the database server. If the server granted the request from client, data requested will be sent over.

1.6 Report Structure

This report consists of five chapters. Chapter I focus on the introduction of project developed. It discusses the objectives of the project, problem statement, scope of work, review on the project methodology and the report structure.

In Chapter II we will the discuss background study of the project developed. This chapter will cover the theory and concepts being used in this project as well as the relationship of the project with the existing research and theory. The objectives and the problem statement of the project will also be discussed.

Chapter III focuses on the project methodology. It will discuss the procedures of the project and the methods used to develop the project. It will explain on how the application will behave and how it will interact with the database server.

Chapter IV will discuss about the result of the project and the problems that occurred during the development of the project. It will also discuss about how to troubleshoot the problems and whether the objectives of the project is realized or not.

Chapter V is the conclusion on the four chapters before where it describes on the overall project. It contains the brief explanation on chapters before. It also includes the recommendation for the future development of the project.

CHAPTER II

LITERATURE REVIEW

Literature review is the study of the application developed, the Web Services, the database server, the Pocket PC and other subjects that related and contributed to this project. This literature review will also give an example of the popular client-server architecture in Malaysia, the m2umobile application as well as the GPRS network provided by the telecommunication company in Malaysia.

2.1 Pocket PC

A Pocket PC, abbreviated P/PC or PPC, is a specification for a handheld-sized computer that runs a specific version of the Windows CE operating system. It may have the capability to run an alternative operating system like NetBSD or Linux. It has many of the capabilities of modern desktop PCs. The example of Pocket PC is shown in Figure 2.1

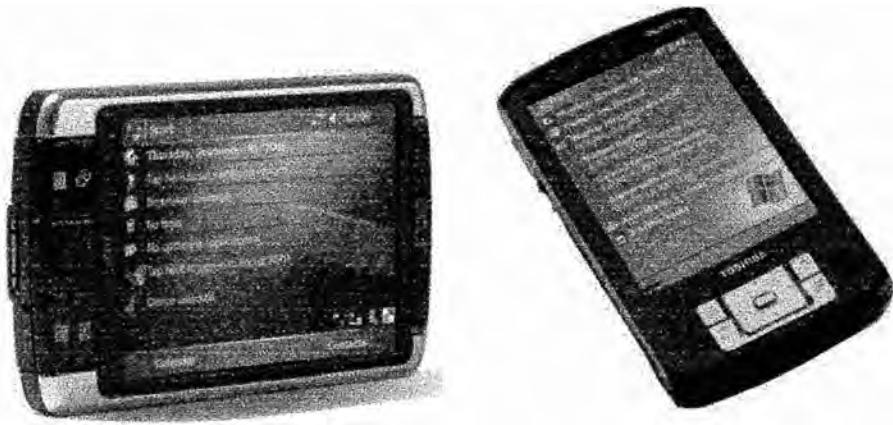


Figure 2.1 Pocket PC Models is Different According to Developer

According to Microsoft [1], the Pocket PC is define as handheld device that enables users to store and retrieve e-mail, contacts, appointments, tasks, play multimedia files, games, exchange text messages with MSN Messenger, browse the Web, and more.. From a technical standpoint, Pocket PC is a Microsoft specification that sets various hardware and software requirements for mobile devices bearing the Pocket PC label. For instance, any device which is to be classified as a Pocket PC must:

- Run Microsoft's Windows Mobile, Pocket PC edition
- Come bundled with a specific suite of applications in ROM
- Include a touch screen
- Include a directional pad or touchpad
- Include a set of hardware application buttons
- Be based on an Advanced RISC Machine, ARM version 4 compatible CPU, Intel XScale CPU, MIPS CPU or SH3 CPU.

Some of these devices also include mobile phone features. PPC are enhanced to Smart phones using Windows Mobile 5.0 operating systems. Windows Mobile 5.0 marked the convergence of the Phone Edition and Professional Edition operating systems into one system that contains both phone and PDA capabilities. A phone

application was included in the operating system, OS and all personal information manager, PIM applications were updated to interface with it.

Windows Mobile 5.0 was also compatible with Microsoft's Smartphone operating system and was capable of running Smartphone applications. It store all user data in flash memory, leaving the RAM to be used only for running applications, as it would be on a desktop computer. It can also be used with many other add-ons like GPS receivers, barcode readers, RFID readers, and cameras.

2.1.1 Windows CE Architecture

Windows CE according to Microsoft [4] is a variation of Microsoft's Windows operating system for minimalistic computers and embedded systems. Windows CE is a distinctly different kernel, rather than a trimmed-down version of desktop Windows. Windows CE is optimized for devices that have minimal storage. Devices are often configured without disk storage, and may be configured as a closed system that does not allow for end-user extension.

Windows CE conforms to the definition of a real-time operating system, with deterministic interrupt latency. It supports 256 priority levels and uses priority inheritance for dealing with priority inversion. The fundamental unit of execution is the thread and thus helps to simplify the interface and improve execution time.

Many platforms have been based on the core Windows CE operating system, including Microsoft's AutoPC, Pocket PC 2000, Pocket PC 2002, Mobile 2003, Mobile 2003 SE, Mobile 5.0, Mobile 6.0 Smartphone 2002, Smartphone 2003 and many industrial devices and embedded systems. Windows CE even powered select games for the Sega Dreamcast, the Gizmondo handheld, and can run on modified Microsoft Xbox game consoles.

2.1.2 Windows Mobile

Windows Mobile is best described as a subset of platforms based on a Windows CE underpinning [4]. Currently, Pocket PC which is now called Windows Mobile for Pocket PC, SmartPhone, and PocketPC Phone Edition are the three main platforms under the Windows Mobile umbrella. Each platform utilizes different components of Windows CE, as well as supplemental features and applications suited for their respective devices.

Windows Mobile for Pocket PC carries some standard features in most of its versions. One of it is Today Screen shows the current date, owner information, upcoming appointments, e-mail messages, and tasks. Users can customize the screen by selecting what information they wish to be displayed. It also includes the notification bar which includes icons to notify the status of Bluetooth, etc. Programs can be installed which adds extra items to the Today screen. One of these is Microsoft Money for Pocket PC. The background image can be customized directly through the Pocket PC, or themes can be created and synchronized onto the Pocket PC.

It also has the taskbar that shows the current time, the volume, and the connectivity status. When a program or message box is open the blank space after the clock is filled with an OK or close icon. The main feature of the taskbar is the Start Button, which is designed similarly to the Start Button which features on desktop versions of Windows. The Start Menu features recently opened programs at the top, nine customizable menu entries, and links to the program, settings, find, and help.

Besides that it also have Office Mobile which is a suite of Mobile versions of Microsoft Office applications is included in Windows Mobile. It includes Word Mobile, Excel Mobile and PowerPoint Mobile which are included since Windows Mobile 5.0. These versions include many of the features which are used in desktop versions, but some other features like inserting tables and images have not been included in pre 5.0 versions. ActiveSync has capabilities which convert desktop versions of files to Office